

NPIC/D-125-61
21 November 1961

MEMORANDUM FOR: Deputy Director (Intelligence)

**SUBJECT: Executive Seminar in Operations Research,
16-17 November 1961, at Brookings
Institution, Washington, D. C.**

1. The purpose of this memorandum is to offer a brief report plus personal impressions of this first Seminar in Operations Research at the Brookings Institution.

2. The Seminar was attended by 35 representatives of 17 Federal Agencies as listed in the attached Roster. A total of 174 nominations was received by the Civil Service Commission indicating how widespread government interest is in Operations Research. Other nominees will be picked up in subsequent seminars by June 1962. Mr. Frank Caracciolo of the Civil Service Commission served as moderator of the seminar which was divided into eight substantive discussions as follows:

**a. HISTORY OF OPERATIONS RESEARCH; DEFINITIONS;
PHILOSOPHY OF OPERATIONS RESEARCH; GOALS**

Kara Glaser
National Bureau of Standards
Department of Commerce

**b. MODELS, THEIR RANGE OF OPERATIONS AND USEFULNESS;
HYPOTHESES; STRUCTURE OF PROBLEMS**

Saul Gass
International Business Machines
Corporation

**c. TYPES OF MANAGEMENT PROBLEMS TO WHICH OPERATIONS
RESEARCH CAN BE APPLIED**

James Mclynn
Booz-Allen Applied Research, Inc.

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d. IMPACT OF OPERATIONS RESEARCH ON VARIOUS LEVELS OF MANAGEMENT: THE POSITIVE (AND THE NEGATIVE) BY-PRODUCTS

**J. W. Smith
Department of the Navy**

e. OPERATIONS RESEARCH TRENDS ABROAD

**David Hertz
Arthur Andersen & Company**

f. SPECIAL APPLICATIONS OF OPERATIONS RESEARCH IN VARIOUS FIELDS

**Morris Hansen
Bureau of the Census
Department of Commerce**

g. RESULTS: MEASURING AND EVALUATING THE EFFECTIVENESS OF OPERATIONS RESEARCH AS A MANAGEMENT TOOL

**Fred Moore
The RAND Corporation**

h. THE FUTURE OF OPERATIONS RESEARCH IN GOVERNMENT

**Herbert Striner
The Brookings Institution**

3. All of the lecturers indicated that there was no universally acceptable definition of Operations Research. Generally speaking, Operations Research is a composite activity in that it makes use of concepts and techniques from many fields of knowledge. Therefore, its meaning is not easily compressed. Its purpose is to provide a basis for decision making - for directing and controlling operations.

4. The lecturers were very well qualified and generally quite good. However, few visual aids were used, and it was hard to find the analogy in lecture for real life problems back at the office. I felt that we were being presented with a ton of OR pitchblende and that some useful nuggets of management-uranium were to be found if you had enough time and patience. The best lectures were presented

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by Ezra Glaser, David Hertz, Fred Moore, and J. W. Smith. Most interesting to me was David Hertz's lecture on "Operations Research Trends Abroad". Hertz has just finished a tour with NATO as an Operations Research consultant and his summary of the state of the art in most of the Western European countries plus his views on USOR developments were most stimulating. OSI could be quite interested in David Hertz's store of knowledge and might possibly be interested in him as a consultant. Some of David Hertz's observations follow:

a. The trend is toward greater and greater utilization of OR by all sections of government and industry. All major powers have ongoing military Operations Research.

b. There is now an International Federation of Operations Research Societies with eleven countries represented.

c. The U.K. started pioneering in Operations Research in 1939, is farthest ahead in most fields, but claims to be behind the U.S. in Industrial Relations. U.K. does little national economic planning with OR and has OR courses in just a few schools (i.e., Manchester and Birmingham). The U.K. does publish an outstanding OR Quarterly and has significant Operations Research efforts going on in:

- (1) Operations Coal Board
- (2) Ministry of Supply
- (3) NAAFE
- (4) Central Electricity Generating Board
- (5) London Transport Agency
- (6) BOAC
- (7) Road Research Laboratories
- (8) Iron and Steel Research Institute
- (9) Home Office
- (10) National Health Services

d. France makes great use of Operations Research in economic planning and is very sophisticated in handling the "big decision" problem. France has a bigger OR Society than the U.K. and more OR consultants than the U.S. The largest OR group in the world is SEMA formed by the Banks of Paris and Netherlands. It handles Market Studies, Road Development, Fishing Port Development, Urban Development, etc. Colwell Beers is the leader. The second largest consulting group in

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France is the CPRO under Charles Salzman which serves as a junior size Rand Corporation for the French Air Force. Another OR group is headed by Elio Ventura and handles day to day decisions of the Paris municipal government. A new French book "La Decision" summarizes the views of its leaders in OR fields. An interesting sidenote: If chaos leads to planning, then the extravagant French effort is understood.

e. In Germany its Operations Research Society was formed in late 1961. Great conflict has attended who should control it - Academicians or Industrialists. Academicians for the moment have won and are now backed by NATO. Little governmental level work has been done. Most current work is in complex problems in such applied industrial fields as Siemens and Lufthansa. A rapid growth is now expected in Germany. Darmstadt University has the best courses and best OR journal. Paradox: Unlike France, Germany is so well off economically yet so far behind in OR.

f. Switzerland - Very active in OR with big groups in SWISSAIR and Eidg. Tech. Hochschule, Zurich.

g. Holland - Most significant work at Philips Industrial Complex, Eindhoven and the Econometric Institute, Rotterdam.

h. Austria - A small OR effort.

i. USSR - Is deeply involved in OR. It may be one of the first in the field as Kantorovich's 1939 thesis, "Mathematical Methods of Organizing Planning and Production" (just translated) would indicate. By 1958 OR ideas had taken hold in high circles in the USSR along with the corollary Institute of Cybernetics, and Linear and Dynamic Programming. An Indian leader told David Mertz that the USSR was working rapidly to develop courses, degrees and other incentives in Operations Research. Another Paradox: USSR is way ahead in Cybernetics, slightly behind in Computers, and very far behind in mass data processing such as would be needed in a planned economy. USSR has been slow to pick up in this field. (later observation reinforced by comments of S. S. Snyder of NSA)

j. Italy - Most OR work being done in connection with Urban Studies.

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k. Turkey - Has a strong military OR effort with a group of 15 mathematicians and 25 military officers. Also provides services to government agencies.

l. Scandinavia (Sweden, Norway and Denmark) - Heavily oriented toward statistics with applied OR in Pulp and Paper Industry and Planning Studies. Here the military also provides OR work for government agencies.

m. Egypt - A good working group led by a Norwegian professor.

n. Pakistan - Interesting OR work going on in connection with the Steel Industry.

o. India - The Statistical Institute for Central Planning uses OR for all government departments.

p. Japan - Tokyo Waseda Group does much OR in Production problems. Has an OR Society and a good Journal. Has provided industry and government with good OR study teams quite cheaply. Example: 1 Professor plus 1 Leader plus 3 Assistants work in teams at a contracted total cost of \$1000 per month. Mitsubishi and Railroads making big use of OR.

q. Australia - Professor Balls at the University of Melbourne is the leader in promoting OR.

r. The growth of Operations Research in the past four years is remarkable. Survey shows that the U.S. Operations Research Journal now has some 2500 subscribers with

618 in Europe
207 in Japan
57 in Australia
36 in USSR
32 in South America
20 in Africa
Remainder in U.S.

s. A new journal, Management Technology, published by the Institute of Management Sciences, P.O. Box 273, Pleasantville, N.Y., is the best new Operations Research journal for laymen.

t. The Operations Research Quarterly is the best U.K.
OR publication for laymen.

u. There is a relation between Operations Research and
Computers, but it is uncertain which is the chicken and which
is the egg.

Lots of Computers in France
Lots of Computers in England
(The new U.K. Atlas Computer reputedly
to be better than the 7090)
Few Computers in Germany

v. The current major disciplines in Operations Research
are Mathematics, Engineering and Economics

5. In conclusion, I found the Operations Research Seminar
interesting and useful. One should not expect to find tailor-made
solutions to his own problems, but it could offer useful leads for
OSI, ORR, ONE, and DD/S personnel. For DD/P it might provide
additional intelligence leads through identification of leading
international personalities and their areas of concentrated interest.
Perhaps after more CIA specialists have taken the course a more
definitive stand could be taken on the need and role of an Operations
Research Team in the CIA structure.

ARTHUR C. LUNDAHL
Director
National Photographic Interpretation Center

Attachments:

- a. Roster of Participants
- b. Brochure: An Executive Seminar
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